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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,887	04/13/2004	Yosef Akhtman	194066-3	4009

23879 7590 09/20/2007

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EXAMINER	
NGUYEN, LEON VIET Q	
ART UNIT	**PAPER NUMBER**
2611	
MAIL DATE	**DELIVERY MODE**
09/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/822,887	AKHTMAN, YOSEF	
	Examiner	Art Unit	
	Leon-Viet Q. Nguyen	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 August 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3 and 8-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3 and 8-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to communication filed on 8/1/07. Claims 1, 3 and 8-13 are pending on this application.

2. Applicant's amendment overcomes the following objection/rejection:

   a. Rejection of claims 1 and 8 under 35 USC 102(b)

   b. Rejection of claims 3, 9, and 10-13 under 35 USC 103(a)

Response to Arguments

3. Applicant's arguments, see Remarks, filed 8/1/07, with respect to the rejection(s) of claim(s) 1, 3, and 8-13 under 35 USC 102(b) and 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Atwater et al (US6175551), Wu et al (US20020172146), Vannatta et al (US5930299) and Jin (US20020159550).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 1 rejected under 35 U.S.C. 103(a) as being unpatentable over Atwater et al (US6175551) in view of Jin (US20020159550).

Re claim 1, atwater teaches discloses a method of reducing the peak-to-average power ratio (PAPR) of a modulated baseband signal, wherein the baseband signal is constituted by a waveform function modulated by information-carrying symbols transmitted in parallel, the method comprising the steps of:

detecting peaks in the modulated baseband signal that exceed a threshold (peak detector 52 in fig. 4, col. 4 lines 59-62), and generating a pulse sequence signal therefrom (the output of peak detector 52 in fig. 4, col. 4 lines 63-66); and

applying a pulse sequence shaping to filter the pulse sequence signal (filter block 56 in fig. 4) for generating a peak-cancellation signal (the output of filter block 56 in fig. 4).

Atwater fails to teach wherein the pulse sequence shaping is designed such that its pass-band is limited to a frequency-domain gap between the edge of an information-carrying frequency bandwidth of the modulated baseband signal and an edge of a frequency band for the baseband signal defined by a spectral mask specifying a maximum tolerable out-of-band emission. However Jin teaches wherein the pulse sequence shaping is designed such that its pass-band is limited to a frequency-domain gap between the edge of an information-carrying frequency bandwidth of the modulated baseband signal and an edge of a frequency band for the baseband signal defined by a spectral mask specifying a maximum tolerable out-of-band emission (¶0028-¶0033).

Therefore taking the combined teachings of Atwater and Jin as a whole, it would have been obvious to incorporate the method of Jin into the method of Atwater. The motivation to combine Jin and Atwater would be maximize PAR reduction (¶0034).

Re claim 8, the modified invention of Atwater teaches a method further comprising subtracting (adder 64 in fig. 4 of Atwater, col. 5 lines 6-8 Atwater) the peak-cancellation signal (the output of filter 56 in fig. 4 Atwater) from the modulated baseband signal (the output of delay 66 in fig. 4 Atwater) to produce a reduced-PAPR modulated baseband signal.

6. Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atwater et al (US6175551) and Jin (US20020159550) and further in view of Wu et al (US20020172146).

Re claim 3, the modified invention of Atwater teaches a method further comprising sampling the modulated baseband signal (IFFT block 28 in fig. 4 of Atwater, it is well-known in the art that an IFFT performs sampling) prior to the peak detecting step (fig. 4 of Atwater). However Atwater fails to teach oversampling of the signal. Wu teaches the use of an over-sampling IFFT in a transmission path (¶0082).

Therefore taking the modified teachings of Atwater and Jin with Wu as a whole, it would have been obvious to one or ordinary skill in the art at the time the invention was made to incorporate the over-sampling IFFT into the method of Atwater and Jin. The motivation to combined Wu, Jin and Atwater would be to reduce the signal echo at the receiver (¶0082).

Re claim 9, the modified invention of Atwater teaches a method further comprising subtracting (adder 64 in fig. 4 of Atwater, col. 5 lines 6-8) the peak-cancellation signal (the output of filter 56 in fig. 4 of Atwater) from the modulated baseband signal (the output of delay 66 in fig. 4 of Atwater) to produce a reduced-PAPR modulated baseband signal.

7. Claims 10-13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Atwater et al (US6175551) in view of Jin (US20020159550) and further in view of Vannatta et al (US5930299).

Re claim 10, Atwater teaches a transmitter comprising:

a baseband signal generator operable to generate a digital baseband signal from an input data stream (coding block 24 in fig. 4, col. 3 lines 56-60);

a digital-to-analogue converter operable to convert the digital baseband signal into an analogue baseband signal prior to output by a transmitter stage (digital-to-analog converter 36 prior to transmission block 38 in fig. 4);

a signal divider for splitting the oversampled digital baseband signal into first and second parts (the output of IFFT 28 is split in fig. 4);

a peak detector arranged to receive the first part of the oversampled digital baseband signal as input (peak detector 52 in fig. 4) and operable to output a pulse sequence signal containing a pulse for each peak in the oversampled digital baseband signal that exceeds a threshold level (col. 4 lines 61-66);

a pulse shaping filter operable to receive the pulse sequence signal (filter block 56 in fig. 4) and convert it into a filtered clipping signal (the output of filter block 56 in fig. 4); and

a signal combiner operable (adder 64 in fig. 4) to subtract the filtered clipping signal from the second part of the oversampled digital baseband signal (col. 5 lines 6-8) so as to produce a digital baseband signal with reduced PAPR for input to the digital-to-analogue converter (col. 1 line 67 – col. 2 line 6).

Atwater fails to teach wherein the filter has a pass-band limited to a frequency-domain gap between an edge of an information-carrying frequency bandwidth of the modulated baseband signal and an edge of a frequency band for the baseband signal defined by a spectral mask specifying a maximum tolerable out-of-band emission.

However Jin teaches wherein the filter is designed such that its pass-band is limited to a frequency-domain gap between the edge of an information-carrying frequency bandwidth of the modulated baseband signal and an edge of a frequency

band for the baseband signal defined by a spectral mask specifying a maximum tolerable out-of-band emission (¶0028-¶0033).

Therefore taking the combined teachings of Atwater and Jin as a whole, it would have been obvious to incorporate the method of Jin into the method of Atwater. The motivation to combine Jin and Atwater would be maximize PAR reduction (¶0034).

Atwater also fails to teach an oversampling filter arranged between the baseband signal generator and digital-to-analogue converter operable to oversample the digital baseband signal to generate an oversampled digital baseband signal. Vannatta teaches a transmitter (fig. 1) with an oversampling filter (FIR filter 164 in fig. 1, col. 3 lines 9-15) arranged between the baseband signal generator (encoder 120 in fig. 1) and digital-to-analog converter (DAC 168 in fig. 1).

Therefore taking the combined teachings of Atwater and Vannatta as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the filter of Vannatta into the transmitter of Atwater. The motivation to combine Vannatta and Atwater would be to reduce the peak-to-average power ratio of a modulated signal to allow an increase in power amplifier efficiency (col. 2 lines 14-16 and col. 2 lines 25-28).

Re claim 11, the modified invention of Atwater teaches a transmitter wherein the peak detector is further operable to output the pulse sequence signal comprising pulses

having a magnitude corresponding to the amount by which each peak exceeds the threshold level (col. 4 lines 59-66 in Atwater).

Re claim 12, Atwater fails teaches a transmitter wherein the pulse shaping filter comprises an FIR filter. However Vannatta teaches using FIR pulse shaping filters (col 1 lines 24-25).

Therefore taking the combined teachings of Atwater and Vannatta as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the FIR filter of Vannatta into the transmitter of Atwater. The motivation to combine Vannatta and Atwater would be to limit interference with adjacent frequency channels (col. 1 lines 25-26).

Re claim 13, all of the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 12.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon-Viet Q. Nguyen whose telephone number is 571-

270-1185. The examiner can normally be reached on monday-friday, alternate friday off, 7:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leon-Viet Nguyen/
Assistant Examiner Art Unit 2611

David Payne
DAVID C. PAYNE
SUPERVISORY PATENT EXAMINER